

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

FORM S-1

**REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

YIELD10 BIOSCIENCE, INC.

(Exact Name of Registrant as Specified in Its Charter)

Delaware
(State or Other Jurisdiction of
Incorporation or Organization)

2870
(Primary Standard Industrial
Classification Code Number)

04-3158289
(I.R.S. Employer
Identification Number)

**19 Presidential Way
Woburn, Massachusetts 01801
(617) 583-1700**

(Address, Including Zip Code, and Telephone Number, Including Area Code, of Registrant's Principal Executive Offices)

**Dr. Oliver P. Peoples
President & Chief Executive Officer
Yield10 Bioscience, Inc.
19 Presidential Way
Woburn, Massachusetts 01801
(617) 583-1700**

(Name, Address, Including Zip Code, and Telephone Number, Including Area Code, of Agent for Service)

Copies to:

Megan N. Gates, Esq.
Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
One Financial Center
Boston, Massachusetts 02111
(617) 542-6000

Michael Nertney, Esq.
Ellenoff Grossman & Schole LLP
1345 Avenue of the Americas
New York, NY 10105
(212) 370-1300

**Approximate date of commencement of proposed sale to the public:
As soon as practicable after the effective date of this registration statement.**

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, as amended (the "Securities Act"), check the following box.

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. File No. 333-221283

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer

Accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company)

Smaller reporting company

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act.

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	Proposed Maximum Aggregate Offering Price(1)(2)	Amount of Registration Fee
Class A Units consisting of:	\$	—
(i) Shares of common stock, par value \$0.01 per share		
(ii) Series A Warrants to purchase common stock		
(iii) Series B Warrants to purchase common stock		
Class B Units consisting of:	\$	—
(i) Shares of Series A Preferred Stock, par value \$0.01		
(ii) Shares of common stock issuable on conversion of Series A Preferred Stock (3)		
(iii) Series A Warrants to purchase common stock		
(iv) Series B Warrants to purchase common stock		
Common Stock issuable upon exercise of Warrants	\$	—
Total	\$ 6,037,500.00	\$ 751.67

- (1) Estimated solely for the purpose of calculating the amount of the registration fee pursuant to Rule 457(o) under the Securities Act of 1933, as amended (the "Securities Act").
(2) Includes the price of additional shares of common stock and warrants to purchase shares of common stock that the underwriters have the option to purchase to cover over-

allotments, if any.

(3) No separate fee is required pursuant to Rule 457(i) under the Securities Act.

This Registration Statement shall become effective upon filing with the Securities and Exchange Commission in accordance with Rule 462(b) promulgated under the Securities Act of 1933, as amended.

**EXPLANATORY NOTE AND INCORPORATION OF
CERTAIN INFORMATION BY REFERENCE**

This Registration Statement is being filed with the Securities and Exchange Commission (the “Commission”) pursuant to Rule 462(b) under the Securities Act of 1933, as amended. This Registration Statement incorporates by reference the contents of, including all amendments and exhibits thereto and all information incorporated by reference therein, the Registration Statement on Form S-1 (Registration No. 333-221283), which was declared effective by the Commission on December 18, 2017, and is being filed solely for the purpose of registering an increase in the maximum aggregate offering price of \$6,037,500. The required opinions and consents are listed on the Exhibit Index attached hereto.

EXHIBIT INDEX

Exhibit Number	Description of Exhibit
5.1	Opinion of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
23.1	Consent of RSM US LLP, an independent registered public accounting firm.
23.2	Consent of PricewaterhouseCoopers LLP, an independent registered public accounting firm.
24.1	Power of Attorney (included in the signature pages to the Registration Statement)



One Financial Center
Boston, MA 02111
617-542-6000
617-542-2241 fax
www.mintz.com

December 18, 2017

Yield10 Bioscience, Inc.
19 Presidential Way
Woburn, Massachusetts 01801

Ladies and Gentlemen:

We have acted as counsel to Yield10 Bioscience, Inc., a Delaware corporation (the “Company”), in connection with the Company’s (i) Registration Statement on Form S-1 (Registration Statement No. 333-221283) initially filed with the Securities and Exchange Commission (the “Commission”) under the Securities Act of 1933, as amended (the “Act”), on November 2, 2017, and as subsequently amended (the “Initial Registration Statement”) and (ii) additional Registration Statement on Form S-1 filed pursuant to Rule 462(b) under the Act (the “462(b) Registration Statement”, and collectively with the Initial Registration Statement, the “Registration Statement”). The 462(b) Registration Statement relates to the registration of up to an additional \$6,037,500.00 of Securities (as defined below), which consist of (i) Class A Units (the “Additional Class A Units”), with each Additional Class A Unit consisting of one share of the Company’s common stock, par value \$0.01 per share (“Common Stock”), a Series A common warrant to purchase one share of Common Stock (a “Series A Warrant”) and a Series B common warrant to purchase one-half of one share of Common Stock (a “Series B Warrant”) (ii) Class B Units (the “Additional Class B Units”, and collectively with the Additional Class A Units, the “Additional Units”), with each Additional Class B Unit consisting of one share of the Company’s Series A convertible preferred stock, par value \$0.01 per share (“Series A Preferred Stock”), a Series A Warrant and a Series B Warrant, (iii) shares of Common Stock issuable upon conversion of the shares of Series A Preferred Stock and (iv) shares of Common Stock issuable upon exercise of the Series A Warrants and Series B Warrants (the “Warrant Shares”) issued under each of the Additional Class A Units and the Additional Class B Units (each a “Warrant” and collectively, the “Warrants”) (i) through (iv) collectively, the “Securities”). The Additional Units are to be sold by the Company pursuant to an underwriting agreement (the “Underwriting Agreement”) to be entered into by and between the Company and Ladenburg Thalmann & Co., Inc. on behalf of themselves and as representative to the several underwriters to be named therein. The Securities are to be offered and sold in the manner described in the Initial Registration Statement and the related prospectus included therein (the “Prospectus”).

In connection with this opinion, we have examined originals or copies, certified or otherwise identified to our satisfaction, of: (i) the Amended and Restated Certificate of Incorporation of the Company, as amended through the date hereof; (ii) the Amended and Restated Bylaws of the Company, as amended through the date hereof; (iii) the Certificate of Designation of Series A Convertible Preferred Stock to be filed with the Secretary of State of the State of Delaware, (iv) certain resolutions of the Board of Directors of the Company (the “Board”) relating to the issuance, sale and registration of the Securities; (v) the Initial Registration Statement; (vi) the Rule 462(b) Registration Statement, (vii) the Prospectus and (viii) the Underwriting Agreement. In addition, we have examined originals or copies, certified or otherwise identified to our satisfaction, of certain other corporate

Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.

BOSTON | WASHINGTON | NEW YORK | STAMFORD | LOS ANGELES | SAN FRANCISCO | SAN DIEGO | LONDON

records, documents, instruments and certificates of public officials and of the Company, and we have made such inquiries of officers of the Company and public officials and considered such questions of law as we have deemed necessary for purposes of rendering the opinions set forth herein. Our opinions are limited to the matters stated herein and no opinion is implied or may be inferred beyond the matters expressly stated. As to certain factual matters, we have relied upon a certificate of an officer of the Company and have not sought to independently verify such matters.

In rendering our opinion set forth below, we have assumed that (i) each document submitted to us is accurate and complete; (ii) each such document that is an original is authentic; (iii) each such document that is a copy conforms to an authentic original; and (iv) all signatures (other than signatures on behalf of the Company) on each such document are genuine. We have further assumed the legal capacity of natural persons, and we have assumed that each party to the documents we have examined or relied on (other than the Company) has the legal capacity or authority and has satisfied all legal requirements that are applicable to that party to the extent necessary to make such documents enforceable against that party. We have further assumed that the Company will not in the future issue or otherwise make unavailable so many shares of Common Stock that there are insufficient remaining authorized but unissued shares of Common Stock for issuance pursuant to exercise of the Warrants. We have also assumed that all of the shares of Common Stock issuable or eligible for issuance pursuant to exercise of the Warrants following the date hereof will be issued for not less than par value. We have not verified any of those assumptions.

Based upon, subject to and limited by the foregoing, we are of the opinion that (i) the shares of Common Stock included in the Additional Class A Units, when issued against payment therefor as set forth in the Registration Statement, will be validly issued, fully paid and non-assessable; (ii) the shares of Series A Preferred Stock included in the Additional Class B Units, when issued against payment therefor as set forth in the Registration Statement, will be validly issued, fully paid and non-assessable; (iii) the shares of Common Stock, when issued upon conversion of the shares of Series A Preferred Stock, will be validly issued, fully paid and non-assessable (iv) the Warrants, when issued as set forth in the Registration Statement will be legal, valid and binding obligations of the Company, enforceable against the Company in accordance with their terms; (v) the Warrant Shares, when issued upon exercise of the Warrants against payment therefor as set forth in the Registration Statement, will be validly issued, fully paid and non-assessable; (vi) the Additional Class A Units, when duly delivered by the Company against the payment of consideration therefor and as contemplated in the Registration Statement, will constitute valid and legally binding obligations of the Company; and (vii) the Additional Class B Units, when duly delivered by the Company against the payment of consideration therefor and as contemplated in the Registration Statement, will constitute valid and legally binding obligations of the Company.

We express no opinion as to matters governed by any laws other than the Delaware General Corporation Law and the federal laws of the United States of America, as in effect on the date hereof.

We hereby consent to the filing of this opinion as an exhibit to the Rule 462(b) Registration Statement and to the reference to our firm under the caption "Legal Matters" in the Prospectus. In giving such permission, we do not admit hereby that we come within the category of persons whose consent is required under Section 7 of the Act, or the rules and regulations of the Commission thereunder. This opinion is expressed as of the date hereof, and we disclaim any undertaking to advise you of any subsequent changes in the facts stated or assumed herein or of any subsequent changes in applicable law.

Very truly yours,

/s/ Mintz, Levin, Cohn, Ferris, Glovsky & Popeo, P.C.

Mintz, Levin, Cohn, Ferris, Glovsky & Popeo, P.C.

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in this Registration Statement on Form S-1 of Yield10 Bioscience, Inc. filed pursuant to Rule 462(b) of the Securities Act of 1933, of our report dated March 30, 2017, relating to the consolidated financial statements of Yield10 Bioscience, Inc. and subsidiaries, appearing in the annual report on Form 10-K of Yield10 Bioscience, Inc. for the year ended December 31, 2016, incorporated by reference in the Registration Statement (Form S-1 No. 333-221283) declared effective on December 18, 2017.

We also consent to the reference to our firm under the heading “Experts” in such Registration Statement.

/s/ RSM US LLP

Boston, Massachusetts
December 18, 2017

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in this Registration Statement on Form S-1 filed pursuant to Rule 462(b) of the Securities Act of 1933 of our report dated March 29, 2016, except for the effects of discontinued operations discussed in Note 15 to the consolidated financial statements as to which the date is March 30, 2017, relating to the financial statements, which appears in Yield10 Bioscience, Inc.'s (formerly known as Metabolix, Inc.) Annual Report on Form 10-K for the year ended December 31, 2016. We also consent to the reference to us under the heading "Experts" in such Registration Statement.

/s/PricewaterhouseCoopers LLP
Boston, Massachusetts
December 18, 2017
